

**REMARKS**

The Office Action of May 4, 2007, is discussed in detail below.

**Claim Amendments**

Applicant has amended claim 1 by including the limitations of original claim 21, original claim 22, and removing the final step of setting the phase-change material to new dependent claim 26. Support for this amendment may be found, for example, in original claim 1, original claim 21, and Example 5 of Applicant's specification (see, for example, p. 41, line 16 – p. 42, line 14).

Applicant has cancelled claim 21.

Applicant has cancelled claim 22.

Applicant has added new claim 26 to include the step of setting the phase-change material present in original claim 1.

Applicant has amended claims 15 and 24 to depend from new claim 26 since claims 15 and 24 recite limitation on the setting step.

Applicant has amended claim 23 to depend from amended claim 1 instead of original claim 21 (now cancelled).

**Claim Rejections – 35 USC 112**

*From Paragraph 2 of the Office Action of May 4, 2007:*

**Claims 1 –25 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point and distinctly claim the subject matter which applicant regards as the invention.**

Applicant has amended claim 1 to include a step of providing a modulus of a modular arithmetic system and establishing a programming strategy, where the number of programming states is defined by the modulus, the number of energy pulses applied to program the phase-change material is determined by the input number upon which modular arithmetic is performed, and application of the energy pulses transforms the phase-change material among the programming states defined by the modulus. Applicant's amended claim 1 includes a method of processing an input number based on incrementing a phase-change material through programming states defined by a modulus. The input number controls the number of energy pulses applied and the modulus controls the programming states through which the phase-change material is transformed during processing of the input number. Applicant accordingly believes that amended claim 1 recites a method of modular arithmetic and believes that the rejection under 35 U.S.C. 112, second paragraph, has been overcome by the amendment. Applicant respectfully requests that this rejection be removed.

**Claim Rejections – 35 USC 103(a)**

*From Paragraph 4 of the Office Action of May 4, 2007:*

**Claims 1 – 18, 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ovshinsky et al. (6,141,241).**

U.S. Pat. No. 6,141,241 to Ovshinsky et al. (“Ovshinsky”) discloses a method of operating a phase-change material that includes providing an input number, resetting the phase-change material, applying energy pulses equaling the input number to the phase-change material, providing energy pulses to set the phase-change material, and counting the number of pulses.

Applicant’s amended claim 1 is directed at a method of performing modular arithmetic with a phase-change material where the method includes providing an input number, providing a modulus for a modular arithmetic system, fixing the number of programming states of the phase-change material to be one less than the modulus of the modular arithmetic system, and applying energy pulses to the phase-change material in a number equal to the input number to program the phase-change material through a series of programming states dictated by the modulus.

Ovshinsky fails to disclose a method of programming a phase-change material that tailors the programming to modular arithmetic. Ovshinsky discloses no strategy for selecting energy states for a programming scheme and makes no connection between the number of programming states and the modulus of a modular arithmetic system. By calibrating the number of programming states and/or programming interval with the modulus of a modular arithmetic system, Applicant’s method processes an input number to provide the remainder of an input number relative to a selected modulus. The remainder is a central parameter in modular arithmetic. Ovshinsky does not disclose a method of programming that relates an input number to a remainder based on a relationship to a modulus. Applicant’s claimed programming strategy

relates the energetic manipulation of the phase-change material with the operable aspects of modular arithmetic and is thus distinguishable from Ovshinsky.

Since Ovshinsky fails to disclose Applicant's steps of providing a modulus of a modular arithmetic system and establishing a programming strategy where the number of programming states is directly related to the modulus, Ovshinsky fails to teach each and every element of Applicant's amended claim 1. Applicant accordingly believes that amended claim 1 is patentable over Ovshinsky and respectfully requests that this rejection be removed.

**SUMMARY**

In view of the above amendment, the outstanding claims in the application are Claims 1 – 20 and 23 – 26. In view of the above amendment and accompanying remarks, Applicant believes that all of the outstanding claims are allowable. Applicant respectfully requests withdrawal of the outstanding rejections. If the Examiner has any questions or suggestions regarding this amendment or Applicant's prosecution of this application, he or she is respectfully asked to contact Applicant's representative at the telephone number or email address listed below.

Respectfully submitted,



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